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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Corneal Contact Lens

I, WILHELM PETER SÖHNGES, a German Citizen, of 7 Briennerstrasse, Munchen 2, Germany, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to corneal contact lenses which have different focal lengths as a result of different lens curvature, to give the wearer sharp vision at different distances. Bifocal spectacle lenses are already known for this purpose in optics, particularly for presbyopic people, wherein the top part of the lens has a different curvature from the bottom part, which is usually a reading lens.

With Corneal contact lenses it is impractical to divide the lens surface in this manner, because the position of the separating line or the transition between the two parts of the lens cannot be fixed with respect to the horizontal or cannot be maintained because the contact lens floats on the contact lens liquid. Bifocal contact lenses have therefore been constructed in such manner that the central surface of the lens has a focal length of a given value while a circular annular surface situated between said central surface and the bearing rim of the contact lens has a shorter focal length, i.e., is curved more sharply. No satisfactory solution to the problem is obtained, however, owing to the inevitable floating of the contact lens, since the two different lens zones rarely lie coaxially to the optical axis of the human eye. Hence the disturbing separating line between the distance and close-up part of the bifocal contact lens will practically always extend through the field of vision and create a disturbance. Nor can this disadvantage be obviated by grinding away the separating edge between the two zones.

In opposition thereto, the Corneal contact lens according to the invention is characterised by a continuous or substantially continuous change of the lens curvature on the outside of the contact lens (that is the lens surface away from the eye of a wearer when the lens is in use), so as to give a multifocal lens comprising a large number or an infinite number of concentric intermerging annular zones of different lens curvatures and focal lengths.

The concentrically multifocal lens according to the invention can be produced in simple manner by grinding, turning or pressing, the machined surface being situated on the outside of the lens. This surface can leave free the bearing rim of the contact lens, extending only thereto. The subject of the invention differs in its effect from known bifocal contact lenses in that it not only gives the wearer sharp vision for distance and close-up work but also permits a sliding optical transition so that the wearer has sharp vision at any distance. An important advantage is that there are no optically disturbing transitions, edges, separating lines and the like, whatever, and this gives the wearer a greater feeling of security and freedom.

The inevitable floating of the contact lens on the cornea has no appreciable influence on the sharp vision of the wearer in the case of small changes of position, since the wearer will hardly notice a slight variation in lens curvature of, for example, 0.25 or 0.5 diopters, the direction of view. When the head is inclined, it is well known that the contact lens shifts upwards somewhat, so that the field of view, for example during reading, automatically falls through the more intensely curved close-up zone of the contact lens.

A Corneal contact lens constructed according to the invention is illustrated to a greatly enlarged scale in axial section in the drawing.

On the left of the chain-dotted centre line of the lens various annular lines are shown with the values of their diameters in millimeters. The total diameter assumed for the contact lens is 9.3 mm, so as to give a con-

[Price 4s. 6d.]

tinuously extending lens bearing rim of 0.9 mm width. On the right-hand half of the lens the diopters corresponding to the various annular zones are indicated in mean values for the various annular zones.

The example illustrated has assumed a continuous curvature increase from the centre to the bearing rim of from 2 diopters to 4 diopters. Alternatively, the curvature at the centre may begin with ±0 diopter or with minus values. The annular zones associated with an increase by, for example, 0.5 diopter in each case may have different widths from one another, for example increasing or decreasing widths. It is essential that the curvature of the lens surface should be continuous or substantially continuous. For the invention it is unimportant whether the optical centre is situated exactly at the mathematical centre of the contact lens or is displaced somewhat therefrom.

WHAT WE CLAIM IS:—

1. A Corneal contact lens comprising concentric zones of different curvatures, characterised by a continuous or substantially continuous change of the lens curvature on the outside of the contact lens.

2. A Corneal contact lens as claimed in claim 1, characterised in that the continuous change of the lens curvature extends between the centre point of the lens and its bearing rim.

3. A Corneal contact lens as claimed in either one of claims 1 and 2, characterised in that the annular zones in which the mean variation corresponds to a given diopter value have different widths.

4. A Corneal contact lens substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.

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COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale